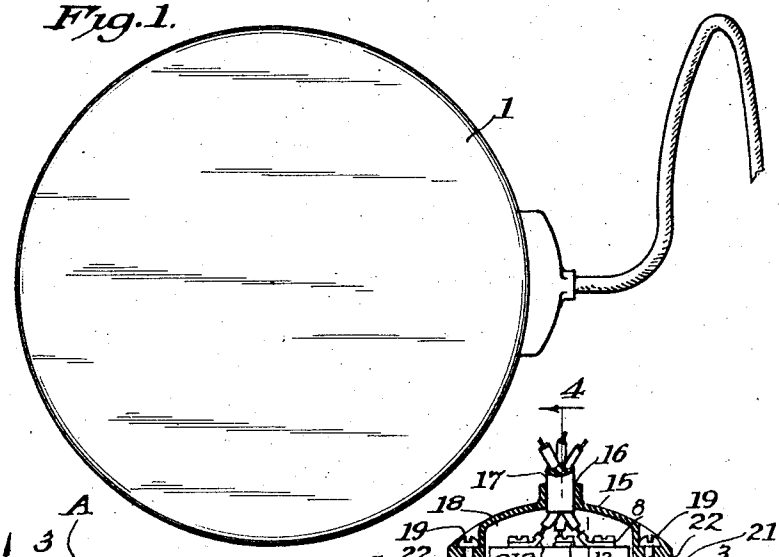
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ELECTRIC HEATING PAD

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Fig. 1.



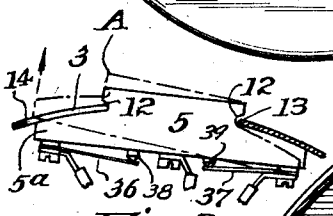


Fig. 3.

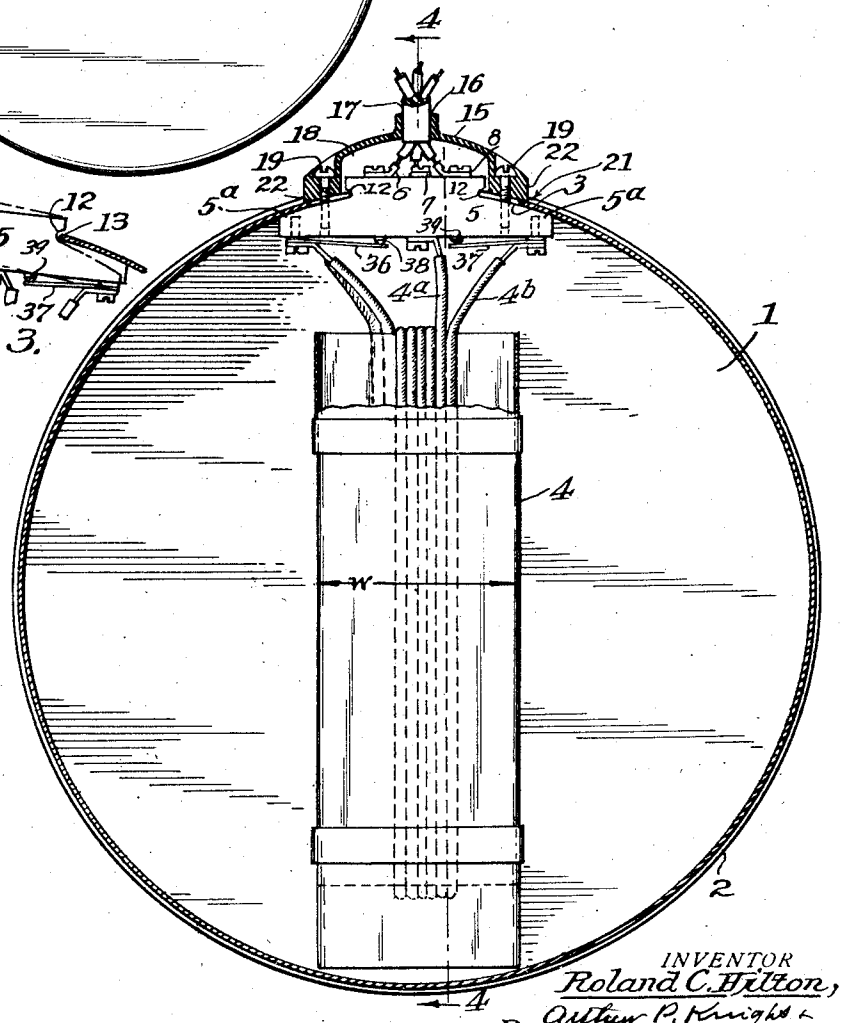


Fig. 2.

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Fig. 4.

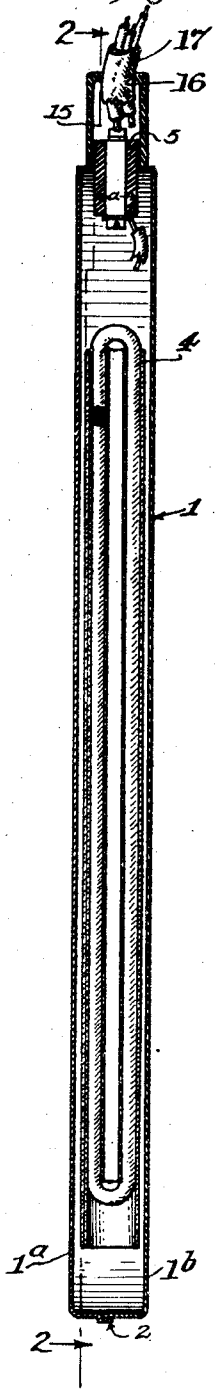
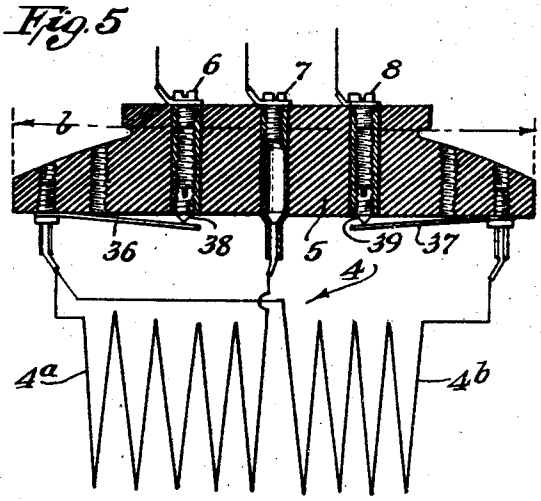


Fig. 5



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2,064,001

ELECTRIC HEATING PAD

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Application December 31, 1934, Serial No. 759,882

3 Claims. (Cl. 219—19)

This invention relates to an electric heating pad and particularly to a heating pad having a metallic casing.

One of the important objects of the device is to provide a heating pad having a metallic envelope whereby such pad may be used in the presence of moisture, as in the application of heat to wet dressings and the like, without damage to the pad, and whereby the pad may be maintained in a sanitary condition by washing or the like, without damage thereto.

A further object of the invention is to provide a heating pad having a metallic envelope and a removable heating element which may be easily removed for the purpose of inspection or repair.

The heating pad of the present invention may comprise, essentially, a disc-shaped hollow metallic envelope provided with an aperture in the peripheral wall thereof through which a heating element may be extended so as to be disposed within said envelope and secured thereto at said aperture. The device further preferably comprises one or more thermostatic control elements associated with the heating element whereby adequate protection against overheating is obtained. Other objects and important features of the device will be brought out in the following description or will be apparent therefrom.

The attached drawings show a preferred embodiment of the invention, and referring thereto:

Fig. 1 is a plan view of the device of the present invention;

Fig. 2 is a sectional view thereof with the metallic envelope broken away to show the heating element and wiring connections therefor;

Fig. 3 is a broken-away view partly corresponding to Fig. 2, showing a position of the heating element connector in the removal of the heating element from the metallic envelope;

Fig. 4 is a sectional view taken on line 4—4 in Fig. 2;

Fig. 5 is a partly diagrammatic view of the positioning means for the resistance heating element.

The device of the present invention may comprise a metallic envelope 1 formed of two comparable metallic shells 1*a* and 1*b* intersecured peripherally in any suitable manner as by a lapped bead 2 although preferably greater than the thickness of the envelope 1. At one point in the rim portion of the envelope 1 an opening 3 is provided through which the heating element 4 may be inserted, said element 4 being of greater dimensions in the plane of said envelope than the thickness of said envelope. Suitable means are provided for positioning the heater element 4 within the envelope 1, and for providing distribution of the current from the electrical lead connections to the said element 4, and such means may comprise a distributor member 5 formed of hard rubber, bakelite, or the like, having a plurality of exteriorly disposed terminals 6, 7, and 8, adapted for connection to one side of a suitable selective switch means. The terminals 6, 7, and 8 extend through the member 5 to the inner edge of said member. The member 5 is sufficiently thin in its dimension *a* (Fig. 4) as to pass freely through the opening 3 above described, but is preferably longer in its dimension *b* (Fig. 5) than the length of said opening 3, whereby, when the member 5 is disposed within said opening and maintained in position in the manner hereinafter described, the end portions 5*a* of said member will bear against the rim portions of the shells 1*a* and 1*b* after the manner shown in Fig. 2. The outer portion of the member 5 is preferably provided with a substantial shoulder or the like positioned at a point such as to define a dimension on said member 5 which is slightly less than the length of the opening 3, to facilitate the insertion and removal of the heating element with respect to the envelope 1. Referring to Fig. 3, such a shoulder may be provided as at 12, so that when the member 5 is moved to one side from the position shown in Fig. 2 to the position shown in Fig. 3 with the shoulder 12 in engagement with the edge 13 of the opening 3, the outer end 5*a* of said member 5 may be pulled outwardly to pass the opposite edge 14 of said opening 3, as shown by the dot-dash position A. After the member 5 has been pulled out a sufficient distance in the manner shown, it may be moved to one side to bring the remaining end clear of the edge 13, and the element 4 may then be withdrawn from the envelope, the width *w* of said element 4 being less than the length of the opening 3. It will be appreciated that the member 5 may be quite symmetrical in shape, having two oppositely disposed shoulders 12.

In order to maintain the member 5 in position within the envelope 1, I provide a cap member 15, formed of hard rubber, "Bakelite", or the like, provided with an opening 16 through which a conduit 17 may extend into connection with a suitable variable-connection switch for controlling selective connection of the terminals 6, 7, and 8 to a source of electrical energy, and with an interior recess 18 of sufficient size to surround the portion of the member 5 at which the termi-

nals 6, 7, and 8 are provided, and further provided with suitable openings through which screws 19 may be passed into threaded engagement with the member 5, as shown in Fig. 2. When the member 5 is positioned centrally with respect to the opening 3, the screws 19 may be tightened down and the corners 13 and 14 clamped between the cap 15 and the end portions 5a of said member 5. To facilitate and strengthen the attachment of the cap member 15, the bead 2 may be flattened, as indicated by the arrow 21, adjacent the edge portions 13 and 14, so so that a flat engagement of the end portions 22 is obtained with the said edge portions. In this regard the length of the cap member 15 is preferably somewhat greater than the length of the opening 3, so as to obtain this desired engagement.

The heating element 4 is divided into two separate coils of differing resistances, for example, a coil 4a of relatively high resistance and a coil 4b of relatively low resistance. It will thus be seen that three different "heats" can be obtained in the pad by selective connection of the two elements 4a and 4b, the element 4a being connected when a low heat is desired, the element 4b being connected when a medium heat is desired, and both elements, 4a and 4b, being connected in parallel when a high heat is desired. For this purpose I connect the coil 4a across two of the terminals, for example, terminals 6 and 7 and the coil 4b across one of said terminals and the remaining terminal, namely, 6 and 8. With the particular arrangement of parts shown in Fig. 5, which construction shows the employment of two separate thermostatic elements such as compound bars 36 and 37, when the terminal 6 makes a common terminal for the two coils, an advantageous operating characteristic is provided in that the compound thermostat bar 36 may be adjusted to break away from the threadedly adjustable contact point 38 at a relatively high temperature, which may be the highest temperature at which the pad could safely operate without causing a serious burn to the patient, and the compound bar 37 may be adjusted with respect to its contact point at a somewhat lower temperature, beyond which the pad should not go in normal use. With the thermostat bars so adjusted, assuming only the high resistance coil 4a to be connected, the current would not be interrupted by the bar 36 until the aforesaid high temperature is reached, but it will be appreciated that such high temperature could not easily be reached except in the event that the pad was allowed to remain heavily insulated by bed clothing or the like, so that there would be no appreciable escape of heat from the pad. When the coil 4b is connected alone for a medium heat, the thermostat 37 would function to interrupt the energy supply to this coil in the event that the lower operating temperature was reached, which lower temperature would ordinarily be greater than the temperature normally reached when only the coil 4a is employed. When both coils are energized, the high heat coil 4b would be cut out of circuit when the lower operating temperature is reached and the low heat coil 4a would remain in the circuit so that the desired temperature would be maintained in the neighborhood of this lower operating temperature, in which case the pad would be no more likely to reach the upper operating temperature than though the pad were connected to its lower heat, as above described. Furthermore, if for some reason, the thermostat 37 should stick and refuse to break contact, the thermostat 36 would still be in condition to break at the upper operating temperature and avoid injury to the user, while if the thermostat 36 should stick and refuse to break contact, the thermostat 37 would break to cut out the low resistance coil at the low operating temperature and the supply of heat offered by the pad would then be limited to the activity of the high resistance coil 4a. It will be appreciated that it is unlikely that both thermostats 36 and 37 would cease to function at the same time.

It will be appreciated that any suitable type of switching means may be used to obtain the desired connection of the coils 4a and 4b, as will be apparent to one skilled in the art.

Furthermore, it will be appreciated that the device of the present invention is equally adaptable for use with direct or alternating current.

I claim:

1. A heating pad comprising: a metallic disc-shaped hollow envelope provided with a circumferentially elongated opening at its edge portion; a resistance heating element removably disposed within said envelope and of such proportional dimensions as to pass inwardly and outwardly through said opening; positioning means for said heating unit comprising an inner member of greater length than said opening and disposed within said envelope and in engagement with the edge portions thereof at opposite ends of said opening and an outer member in engagement with said inner member and having portions engaging the outer edge portions of said envelope at opposite ends of said opening, whereby said outer edge of said envelope is clamped between said inner and outer positioning members, said inner member being provided with shoulder means intermediate the length thereof and projecting outwardly through said opening, and said member being movable to bring said shoulder means in engagement with the edge of said envelope at one end of said opening, said shoulder means being so positioned that the distance between said shoulder means and the end of said member opposite said one end of said opening is less than the length of said opening, whereby said inner member may be removed from said envelope through said opening.

2. A heating pad comprising: a metallic disc-shaped hollow envelope provided with a circumferentially elongated opening at its edge portion; a resistance heating element removably disposed within said envelope and being of greater dimensions in the plane of said envelope than the thickness of said envelope and of such proportional dimensions as to pass inwardly and outwardly through said opening; positioning means for said heating unit comprising an inner member of less width and greater length than said opening and removably disposed within said envelope and having a portion extending outwardly through said opening, said outwardly extending portion being of less length than said opening, and an outer member removably secured to said inner member and having portions engaging the outer edge portions of said envelope at opposite ends of said opening, whereby said outer edge of said envelope is clamped between said inner and outer positioning members.

3. A heating pad comprising: a metallic disc-shaped hollow envelope having a peripheral wall portion provided with a circumferentially elongated opening; a resistance heating unit disposed within said envelope and aligned with said

opening and having its dimension in the plane of said envelope materially greater than the thickness of said envelope and less than the length of said opening, whereby said heating unit may be inserted and removed through said opening; an inner attachment member having a body portion disposed within said envelope, said body portion being of greater length than said opening along the circumference of said envelope and projecting beyond the ends of said opening, with the projecting portions thereof engaging the inner surface of said peripheral wall, and said body portion having its dimension in the direction of the radius of said envelope materially less than the length of said opening, whereby said body portion may be tilted to position to pass through said opening; electrical connection means mounted on said inner attachment member and connected to said heating unit; and an outer attachment member disposed exteriorly of said envelope and engaging the outer surface of said peripheral wall; and means securing said inner and outer attachment members together and serving to clamp said peripheral wall therebetween adjacent the ends of said opening.

ROLAND C. HILTON.